

**REMARKS**

This paper is responsive to the Office Action mailed on September 25, 2007.

Claim 1, 6, 7, 9 and 15-17 are amended, claims 20 and 21 are canceled, and claims 22-28 are added; as a result, claims 1-19 and 22-28 are now pending in this application.

**Affirmation of Restriction Requirement**

During a telephone conversation with Mr. Benjamin Armitage on June 14, 2007, a provisional election was made without traverse to prosecute claims the claims in Group I, which include claims 1-19. Applicants herein affirm the election of Group I, claims 1-19 for prosecution on the merits. Claims 20-21 are drawn to a non-elected invention, and are herein cancelled without prejudice to the filing of any other continuation, divisional, or continuation-in-part application.

**Rejection of the Claims under 35 U.S.C. §103**

Claims 1-6, 8, 10-14 and 18 were rejected under 35 U.S.C. § 102(b) as unpatentable over U.S. Published Application No. 2004/0157110 to Knights, *et al.* (hereinafter, "the Knights reference"), in view of U.S. Patent No. 6,090,858 to El-Sayed (hereinafter, "the El Sayed reference"), and further in view of U.S. Published Application No. 2002/0149002 to Womelsdorf, *et al.* (hereinafter, "the Womelsdorf reference"). Claims 7, 9, 15-17 and 19 were rejected under 35 U.S.C. § 102(b) as unpatentable over the Knights reference in view of the El Sayed reference, and in view of the Womelsdorf reference, and further in view of U.S. Published Application No. 2003/0222048 to Asakawa, *et al.* (hereinafter, "the Asakawa reference"). Applicants disagree with the stated grounds of rejection and desire to further clarify various distinctions of the present invention over the cited art. Reconsideration of the present application is therefore requested in light of the present amendment and following remarks.

Although the disclosed embodiments of the invention may be discussed in comparison to the prior art, it is understood that any discussion of the disclosed

embodiments, as well as any discussion of the differences between the disclosed embodiments of the present invention and the prior art do not define the scope or interpretation of any of the claims. Instead, such discussed differences, if presented, are offered solely to help the Examiner appreciate important claim distinctions.

The Knights reference is cited for allegedly disclosing a supported catalyst for an electrode in a voltage reversal-tolerant fuel cell structure. In particular, the Examiner cites the disclosure of a liquid suspension that may include a finely divided catalyst (*e.g.*, a slurry or an ink) applied to a surface of a supporting substrate that form a catalyst layer onto the substrate.

The Examiner admits, however, that the Knights reference fails to disclose a nano-particle dispersion as claimed. Accordingly, the Examiner cites the El-Sayed reference for allegedly providing this necessary teaching. The El-Sayed reference discloses methods for synthesizing colloidal nano-particles having a capping material that includes a monoacrylate and a polyacrylate.

Notwithstanding the disclosures present in the Knights reference and the El-Sayed reference, the Examiner admits that neither of the foregoing references discloses a charged soluble polymer having a molecular weight that is less than 25,000 atomic mass units (amu). The Examiner therefore cites the Womelsdorf reference for this teaching. In pertinent part, the Examiner submits that the foregoing is allegedly taught by the disclosure of an aqueous suspension of zinc oxide nano-particles in a sodium polyacrylate stabilizer. Specifically, the Womelsdorf reference states that the disclosed solution has a mean molecular weight of 5,100.

Applicants note that the Knights reference fails to disclose or to fairly suggest the presence of a microstructure that supports the nano-particle dispersion allegedly taught by the El-Sayed reference, and that the microstructure is suitably configured to receive and retain the nano-particle dispersion. In fact, Applicants note the Knights reference specifically teaches that the catalyst material and electrolyte *do not* extend into the pores that may be present in the substrate material. The Examiner is directed to page 6, paragraph 58, which states in pertinent part:

“...Also shown in Table 1 is the percentage platinum coverage on the carbon support ignoring any surface area arising from micropores (that is, pores less than about 100 nanometers in diameter) of the support. *Since it is likely that neither platinum deposits nor electrolyte may access the surface in these micropores, such surface may be irrelevant with regards to relative platinum coverage...*” (Emphasis added).

Applicants therefore respectfully submit that the teachings extracted from the cited references are conflicting, since the Knights reference clearly teaches that any surface in the micropores is “irrelevant”. Accordingly, Applicants submit that the Knights reference *teaches away* from a microstructure that is configured to attract, receive and retain a nano-particle dispersion.

Turning now to the claims, differences between the claim language and the cited references will be specifically pointed out. Claim 1, as amended, recites in pertinent part: “A method for making an electrode by depositing nano-particles on an object *having a microstructure*, comprising... coating an object with the nano-particle dispersion thereby disposing nano-particles from the nano-particle dispersion on the object *and into the microstructure* to form an electric conductor,... *wherein the microstructure is configured to receive and retain the nano-particle dispersion...*” (Emphasis added). The Knights reference does not disclose or fairly suggest this. In fact, as described in greater detail above, Applicants submit that the Knights reference *teaches away* from a microstructure that is configured to receive and retain a nano-particle dispersion. Accordingly, claim 1 is allowable over the cited combination of references. Claims depending from claim 1 are also allowable, based upon the allowable form of the base claim, and further in view of the additional limitations recited in the dependent claims. Applicants therefore respectfully request that the rejection of claims 1-6, 8, 10-14 and 18 under 35 U.S.C. §103(a) be withdrawn.

With reference now to the rejection of claims 7, 9, 15-17 and 19, the Examiner has further cited the Asakawa reference in combination with the Knights, El-Sayed and Womelsdorf references. Briefly, the Examiner has applied the Asakawa reference for allegedly disclosing a substrate having features in the claimed dimensional range.

Applicants respond that the Asakawa reference cannot rectify the fundamental incompatibility between the Knights reference and the El-Sayed reference, as discussed in greater detail above. Accordingly, Applicants therefore respectfully also request that the rejection of claims 7, 9, 15-17 under 35 U.S.C. § 103(a) be withdrawn.

*New Claims*

Claims 22-28 are new, and are fully enabled by the present specification. No new matter has been introduced through the presentation of new claims 22-28.

*Reservation of Rights*

In the interest of clarity and brevity, Applicant may not have addressed every assertion made in the Office Action. Applicant's silence regarding any such assertion does not constitute any admission or acquiescence with regard to any matter. Applicant reserves all rights not exercised in connection with this response, such as the right to challenge or rebut any tacit or explicit characterization of any reference or of any of the present claims, the right to challenge or rebut any asserted factual or legal basis of any of the rejections, the right to swear behind any cited reference such as provided under 37 C.F.R. § 1.131 or otherwise, or the right to assert co-ownership of any cited reference. Applicant does not admit that any of the cited references or any other references of record are relevant to the present claims, or that they constitute prior art. To the extent that any rejection or assertion is based upon the Examiner's personal knowledge, rather than any objective evidence of record as manifested by a cited prior art reference, Applicant timely objects to such reliance on Official Notice, and reserves all rights to request that the Examiner provide a reference or affidavit in support of such assertion, as required by MPEP § 2144.03. Applicant reserves all rights to pursue any cancelled claims in a subsequent patent application claiming the benefit of priority of the present patent application, and to request rejoinder of any withdrawn claim, as required by MPEP § 821.04.

Serial No.: 10/781,421

Filed: February 18, 2004

Title: METHOD FOR MAKING AN ELECTRODE BY DEPOSITING NANO-PARTICLES

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney 612-373-6900 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.


Respectfully submitted,

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Date: December 21, 2007

By

  
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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 21st day of December, 2007.

PATRICIA A. HULTMAN

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Signature